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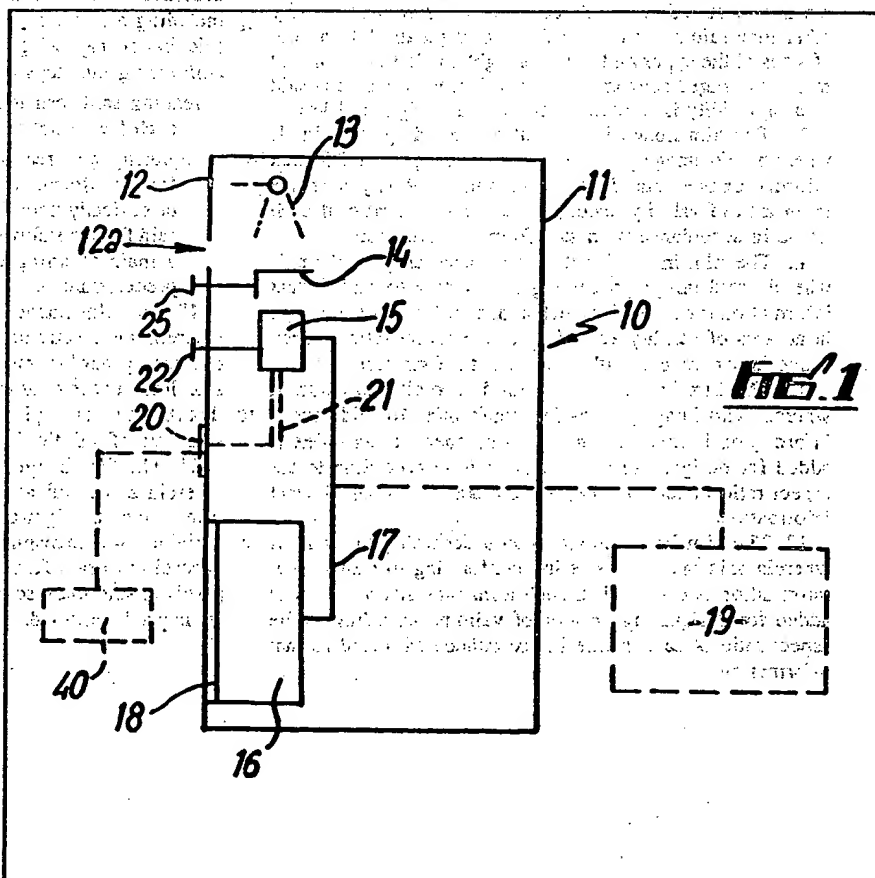
Manchester.

(54) **Improvements in or relating to apparatus for viewing films**

(57) **A film to be viewed is supported in a clamp 14 and is illuminated by light 13 and viewed by video camera 15 connected to a visual display monitor 16 for displaying the view on screen 18.**

Manual or electric controls 22 are provided. A slave monitor 19 can be used.

The camera can rotate to view the film in different orientations, or two fixed cameras can be used. The camera may view the film by reflected light. The camera may have focus change and zoom facilities.



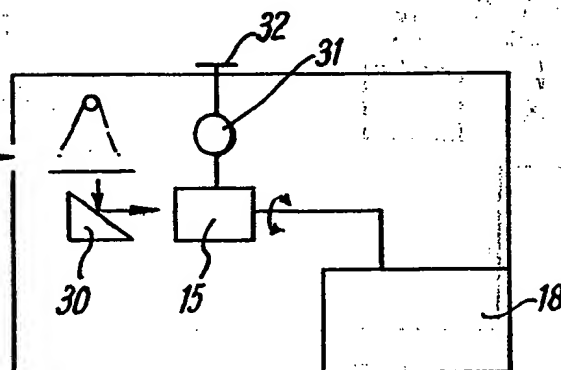
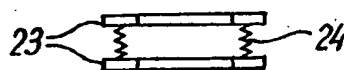
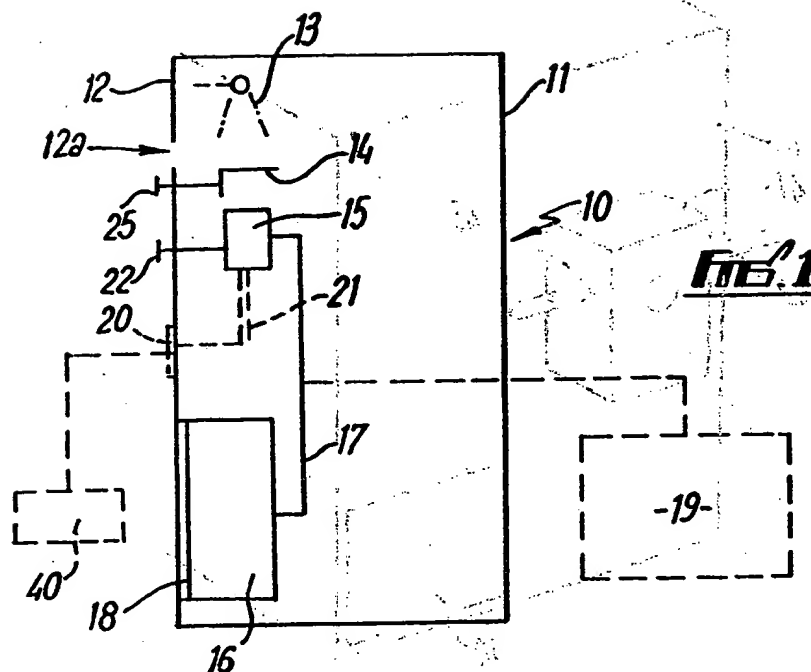
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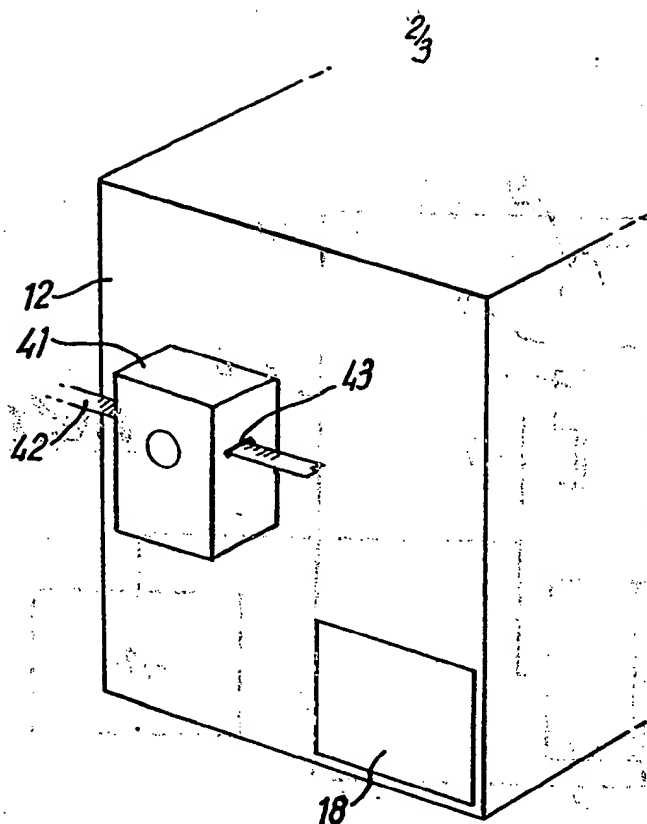


FIG. 4

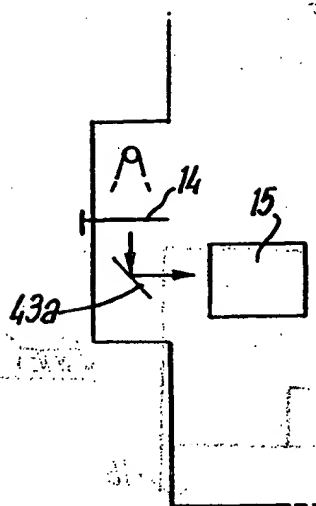


FIG. 5

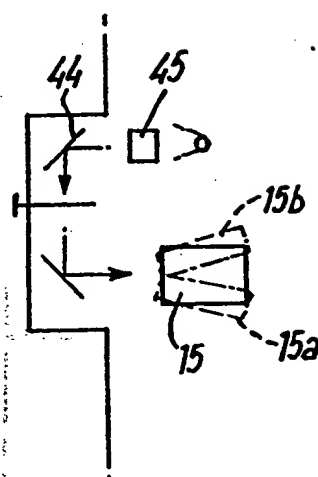
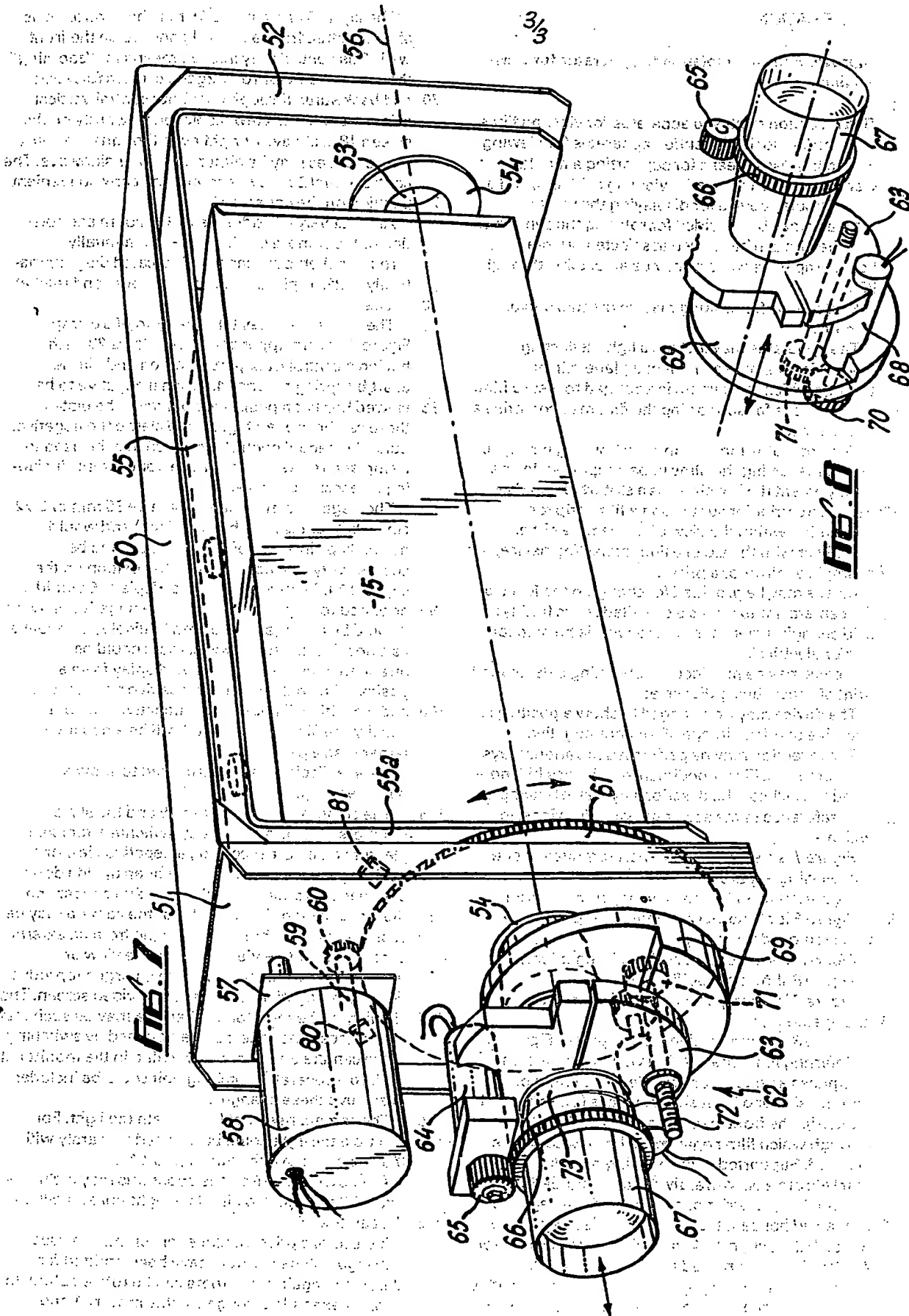


FIG. 6



SPECIFICATION

Improvements in or relating to apparatus for viewing films

5 This invention relates to apparatus for viewing films.

According to this invention apparatus for viewing films comprises means for supporting a film to be viewed, a video camera for viewing said film, and a visual display device for displaying the view.

Means may be provided for rotating the camera so that the film can be viewed at selected orientations. For example the camera may be adjustable through 90°.

15 Said means for rotating may be manual and/or electrical.

The apparatus may include a light deflecting device, for example a prism or a plane mirror, through which the camera is arranged to view a film.

20 The means for supporting the film may comprise a clamp device.

The apparatus may comprise a housing having an inlet for receiving the films to be supported. In one arrangement the housing has a slot which holds a negative carrier for supporting a film strip for orientation within the view of the camera either directly or with the aid of a light deflecting device, for example a mirror or a prism.

Means may be provided for changing the focus of the camera, for example a so-called zoom facility; said changing means may for example be manual and/or electrical.

Means may be provided for obtaining a developed print of a view being displayed.

35 The device may be arranged to show a positive or negative or mirror image of a colour negative.

The invention may be performed in various ways and some specific embodiments with possible modifications will now be described by way of example

40 with reference to the accompanying drawings, in which:-

Figure 1 is a side view with part removed of one film viewing apparatus;

Figure 2 is an enlarged view of part of Figure 1;

45 *Figure 3 is a side view of another apparatus with parts removed for clarity;*

Figures 4 and 5 show another arrangement;

Figure 6 shows a modification;

50 *Figure 7 is a perspective view of a camera arrangement; and*

Figure 8 is a perspective view of part of Figure 7.

Referring to Figure 1, a film viewing apparatus 10 comprises a housing or console 11 having top, bottom, side and front and rear walls (one side wall 55 omitted). The front wall 12 has an opening 12a through which film negatives to be viewed can be inserted. Supported in the housing on suitable brackets are a downwardly directed source 13 of illumination, a carrier or support 14 for a negative to be viewed beneath the light 13, a video camera 15 60 beneath the support 14 and a video display monitor 16 electrically connected through line 17 to the camera 15 for displaying on a screen 18 the negative as viewed by the camera 15. One or more slave 65 video displays 19 may be provided as shown dotted.

The light 13 and camera 15 may be controlled as shown dotted from a control panel 20 on the front wall. This control may include means for "zooming" the camera, and for rotating the camera forwards and backwards through 90° about central vertical axis 21 so that the view displayed forwardly on the screen 18 is always upright even though the view in the negatives may be either upright or sideways. The control panel 20 may be mounted at any convenient 75 position on the console 11.

Alternatively or additionally, the zoom and rotation of the camera can be achieved manually through suitable mechanism indicated diagrammatically at 22. Typically this could be gear and ratchet 80 devices.

The support 14 may take the form of a clamp Figure 2 having upper and lower plates 23 each having a central transparent region and biased apart by spring means 24. When a negative to be 85 viewed has been positioned between the plates, these can be moved together to clamp the negative. Suitable manual control means 25 may be used to clamp and release the negative, for example including an eccentric device.

90 The negatives may for example be 35 mm or 5.72 cm by 5.72 cm (2¼ inch by 2¼ inch) and would normally be in strips of say five or six and be successively moved by hand into position on the support 14. Normally the video display 16 would be arranged to display a negative as a negative view but it could be arranged as desired to display a negative as a positive. If desired the camera could be arranged to provide a negative display from a positive film in the form of a positive transparency 95 and a positive display from a negative film, but usually the film being viewed will be a negative rather than a positive.

A slave display may be arranged to show a positive image.

105 The circuitry of the monitor 16 and the slave monitors may be such that by switching, for example from an external control, a negative view or a positive view or a mirror image or an upside down enlarged reproduction of the negative appears on the video screen. The circuitry of the camera may be such that by switching, for example from an external control, a negative view or a positive view or a mirror image or an upside down enlarged reproduction of the negative appears on the video screen. The circuitry of the monitor and camera may be such that 115 part of these changes may be obtained by switching in the camera and part by switching in the monitor. If desired a separate switching unit could be included to achieve these changes.

120 The camera need not be beneath the light. For example the light could be directed upwardly with the camera above the film support 14.

As shown in Figure 3 the apparatus may include a prism 30 arranged to direct the light horizontally to the camera 15.

125 Instead of a prism, a plane mirror may be used.

In Figure 3 the controls have been omitted for clarity, but again the camera can be rotated about its axis, for example through electric motor 31 and control 32.

In a further modification the apparatus may include a camera indicated diagrammatically at 40 arranged to provide as required a positive developed print, black and white or colour as desired, of the display on the monitor 16.

In the arrangement of Figure 4 and 5, the negative carrier 14 is mounted in a horizontal position in a pod 41 so that the strip 42 of negatives to be viewed can be moved manually from side to side through slots 43, and can be adjusted manually. The light source 13 can be mounted above the carrier (as shown) or below, and the light deflected to the camera 15 by a prism or mirror 43a.

If desired, as shown in Figure 6, the light can be deflected on to the negative by a prism or mirror 44, either downwardly (as shown) or upwardly.

A condenser or condenser lens system 45 may be used in any of these embodiments to spread light from the source over the negative in the carrier.

It will be understood that the apparatus can be such as to give a black and white display or a colour display.

With the apparatus it is possible readily to view the negatives in an enlarged scale and select which if any should be developed or enlarged or otherwise further treated and it is not necessary to develop all the negatives in order to be able to select which if any are suitable for further use or treatment. Because the negatives are displayed on an enlarged scale it is easier to decide whether a particular part of a negative is suitable for further treatment or use.

The display monitor 16 need not be in housing 11 but could preferably be in a separate housing, which could be remote from housing 11.

Figures 7 and 8 show one form of camera arrangement.

A U-shaped plate support 50 has sides 51, 52 with aligned apertures 53 (only one shown) receiving bearings 54 by which U-shaped camera support 55 can rotate in opposed senses about a central axis 56 passing through the apertures. Side 51 mounts a bracket 57 on which is mounted an electric motor 58 having an output shaft 59 carrying pinion 60 meshing with pinion 61 connected to the camera support 55 for rotation therewith. The camera 15 is secured to side 55a of support 55. A lens assembly 62 extends from the camera 15 and is supported in plate 63. An electric motor 64 is mounted in plate 63 and rotates pinion 65 with helical teeth meshing with gear 66 so that on operation of motor 64 a front portion 67 of the lens system can be moved in or out as shown by the arrows to vary the lens system focus. A zoom facility is also provided. A further electric motor 68 is carried in fixed plate 59 and is slidable in plate 63. The motor 68 drives a helical tooth gear 70 meshing with gear 71 fixed on threaded rod 72 which is in threaded engagement with plate 63. As motor 68 rotates, the rod 72 rotates thus moving plate 63 in or out as shown by the arrows (Figure 8) moving portions 67, 73 of the lens system to give a zoom facility.

As described above, the camera 15 can be rotated through 90°, the movement being limited by limit switches 80, 81 engageable with adjustable stops on the gear 61 and controlling the camera motor 58.

It will be understood that if required the motors 58, 68 and 64 can be electrically controlled from a remote location.

The pod 41 could have a slidable upper part which, when in a lower position, closes clamp 23 and excludes light and in an upper position allows adjustment of the film 42.

Instead of rotating the camera to view film either upright or sideways, there could be two fixed cameras, one 15a for viewing upright and one 15b Figure 6 for viewing sideways, with switch means for selectively coupling them to the monitor 16. As indicated in Figure 6, the cameras could be at a slight angle to each other.

CLAIMS

1. Apparatus for viewing films comprising means for supporting a film to be viewed, a video camera for viewing the film, and a visual display device for displaying the view.
2. Apparatus as claimed in Claim 1, comprising means for rotating the camera so that the film can be viewed at selected orientations.
3. Apparatus as claimed in Claim 2, including means for rotating the camera through 90° in opposed senses.
4. Apparatus as claimed in any preceding claim, including a light reflecting device through which the camera views the film.
5. Apparatus as claimed in any preceding claim, in which the film supporting means comprises a clamp device.
6. Apparatus as claimed in any preceding claim, comprising means for changing the focus of a lens system of the camera.
7. Apparatus as claimed in Claim 6, in which the focus changing means comprises means for zooming the lens system.
8. Apparatus as claimed in Claim 6 or Claim 7, comprising electric means for changing the focus and further electric means for zooming the lens system.
9. Apparatus as claimed in any preceding claim, including means for obtaining a developed print of a view being displayed.
10. Apparatus as claimed in Claim 1, comprising two cameras respectively for viewing the film at different orientations.
11. Apparatus as claimed in any preceding claim, including a light source for illuminating the film to be viewed.
12. Apparatus for viewing films substantially as hereinbefore described with reference to and as shown in Figure 1, or Figure 3, or Figure 5, or Figure 6, or Figures 7 and 8, of the accompanying drawings.